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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/092,201	03/04/2002	Paul E. Brunemeier	M-12347 US	8606

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EXAMINER

ROBERTSON, JEFFREY

ART UNIT	PAPER NUMBER
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1712

DATE MAILED: 06/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

Office Action Summary	Application No. 10/092,201	Applicant(s) BRUNEMEIER ET AL.	
	Examiner Jeffrey B. Robertson	Art Unit 1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12-16 and 29-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 6-8, 13-16, 29-31 and 36-40 is/are rejected.
- 7) ☒ Claim(s) 1-10, 12-16 and 29-40 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: on pages 6 and 7, the status of 09/782,985 should be updated.

Appropriate correction is required.

Claim Objections

2. Claims 1-10, 12-16, and 29-40 are objected to because of the following informalities: For claims 1, 4, 7, 9, 10, 29, the claims recite the phrase "said second component for form". It appears that "for" should be changed to "to". Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 6, 8, 13, and 14 are rejected under 35 U.S.C. §102(e) as being anticipated by Koyama et al. (U.S. Patent No. 6,495,253).

For claims 1, 8, and 13, in column 11, lines 45-54, Koyama teaches a composition that contains an ionizing radiation curable resin, a porous silica, and photopolymerization initiator for a hardcoat layer. For claims 6 and 14, in column 7, lines 3-47, Koyama teaches that the use of porous silica particles substantially imparts the anti-Newton ring property, and that UV radiation is used to cure and cross-link the composition. In column 7, lines 41-46, Koyama teaches protusions and recesses on the surface of the material. This teaching, along with the presence of silica particles, indicates that the material is inhomogeneous.

5. Claims 1, 7, and 14-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Ayers (U.S. Patent No. 6,277,766).

For claims 1 and 7, in column 3, lines 53-65, Ayers teaches a solution of fullerene-decorated nanoparticles having porosity and a soluble binder that links the individual particles improving the mechanical properties of the layer. For claims 14-16, the mechanical properties include dielectric constant that is preferably less than 2.0. In column 6, lines 6-8, Ayers teaches that the preferred nanoparticles are silica particles. For claims 6 and 7, in column 8, lines 34-37, Ayers discloses that the binder is cured through ultraviolet radiation and that the predetermined response to radiation is decomposition. Since the material contains a binder and particles, the material is inhomogenous with the particles as the second component substantially determining the dielectric constant of the material.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 29-31 and 36-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ayers in view of Andideh et al. (U.S. Patent No. 6,448,185).

For claim 29, in column 3, lines 53-65, Ayers teaches a solution of fullerene-decorated nanoparticles having porosity and a soluble binder that links the individual particles improving the mechanical properties of the layer. In column 6, lines 6-8, Ayers teaches that the preferred nanoparticles are silica particles. For claims 30 and 31, in column 8, lines 34-37, Ayers discloses that the binder is cured through ultraviolet radiation and that the predetermined response to radiation is decomposition. Since the material contains a binder and particles, the material is inhomogenous with the particles as the second component substantially determining the dielectric constant of the material. For claim 40, in column 9, line 20, Ayers teaches a dielectric constant of 2.4, which is within applicant's range. Although Ayers teaches in column 1, lines 8-14, that the dielectric layers are used in integrated circuits, Ayers does not specifically teach the structure of the integrated circuit claimed by applicant.

For claims 36-39, in column 2, line 13 through column 3, line 15, Andideh teaches an integrated circuit where a silicon wafer substrate is coated with a conductive layer that is preferably copper. Andideh teaches the formation of a barrier layer on top of the conductive layer that is preferably silicon carbide. Andideh teaches the formation of a dielectric layer on top of the barrier layer. In column 5, lines 59-63, Andideh teaches a dual damascene structure.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the dielectric compositions of Ayers in the compositions of Andideh. The motivation would have been that Andideh teaches the advantages of carbon-doped oxides as dielectric layers. Ayers teaches the advantages in

Art Unit: 1712

adhesion of the fullerene-containing silicas (which are carbon-doped oxides).

One of ordinary skill in the art would have been motivated to use the compositions of Ayers in the integrated circuits of Andideh to increase the adhesion of the carbon-doped oxides used.

Response to Arguments

10. Applicant's arguments with respect to claims 1, 6-8, and 13-16 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

11. Claims 2, 3, 12, and 32-25 would be allowable if rewritten to overcome the claim objections set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

12. Claims 4, 5, 9, and 10, would be allowable if rewritten to overcome the claim objections set forth in this Office action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey B. Robertson whose telephone number is (571) 272-1092. The examiner can normally be reached on Mon-Fri 7:00-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119.

Art Unit: 1712

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jeffrey B. Robertson
Primary Examiner
Art Unit 1712

JBR